CLAIMS

What is claimed is:

1. A block valve including a body and power element comprising a diaphragm mounted between a domed head and a support cup on the valve body, a charge located within a head chamber defined by the domed head and one surface of the diaphragm, the support cup and another surface of the diaphragm defining a diaphragm chamber with the body of the expansion valve, a valve stem extending from the diaphragm through a bore in the valve body to a valve element modulating a valve orifice between a first port in the valve body and a second port in the valve body; a return passage through the valve body from a third port to a fourth port, and in fluid communication with the diaphragm chamber;

a refrigerant tube received in one of said ports in said valve body and having a fluid-tight seal therewith, said refrigerant tube including an annular bead extending around the exterior of the tube in a direction transverse to the axis of the tube, said one port defined by an axial bore, and a first counterbore co-axial with said bore and formed inwardly from a surface of the body, said bore and first counterbore defining an inner shoulder, said refrigerant tube being received in said bore with said bead being closely received within said first counterbore and engaging said inner shoulder uniformly around the circumference of the tube;

a portion of said valve body surrounding the opening to said bore on said surface being mechanically staked and forced into engagement with said bead so as to secure the tube to the valve body in fluid-tight relation therewith.

2. The block valve as in claim 1, wherein said portion of said valve body surrounding the bore is mechanically formed around the bead and at least partially encloses the bead within the first counterbore.

3. The block valve as in claim 2, wherein said shoulder defines a sharp edge, said edge being forced against a concave junction between said refrigerant tube and said bead to provide a fluid-tight seal.

4. The block valve as in claim 3, wherein said bore further includes a second counterbore co-axial with said first counterbore and extending from said first counterbore into said valve body, a distal end of said refrigerant tube being closely received within said second counterbore.

5. The thermostatic expansion valve including a body having a first, inlet port for receiving refrigerant from a condenser; a second, outlet port for providing refrigerant to an evaporator, a valve assembly for modulating a valve orifice between said first and second ports; a third, inlet port for receiving refrigerant from the evaporator; a fourth, outlet port for providing refrigerant to a compressor, and a power element sensitive to the refrigerant flowing between the third and fourth ports and operatively connected to the valve assembly;

a refrigerant tube received in one of said ports in said valve body and having a fluid-tight seal therewith, said refrigerant tube including an annular bead extending around the exterior of the tube in a direction transverse to the axis of the tube, said one port defined by an axial bore, and a first counterbore co-axial with said bore and formed inwardly from a surface of the body, said bore and first counterbore defining an inner shoulder, said refrigerant tube being received in said bore with said bead being closely received within said first counterbore;

a portion of said valve body surrounding the opening to said bore on said surface being mechanically staked and forced into engagement with said bead so as to secure the tube to the valve body in fluid-tight relation therewith

6. A method for attaching a refrigerant tube to a thermostatic expansion valve having a body, comprising the steps of:

forming a bore axially through the body, said bore including a counterbore extending axially inward from a surface of the block valve with a radius larger than the bore,

forming a bead around the circumference of the tube toward one end of the tube, inserting the refrigerant tube with the formed bead axially into the bore from the surface with the bead of the refrigerant tube closely received in the counterbore, and subsequently,

mechanically staking the surface of the body around the bore in such a manner that the valve body material engages the bead to secure the refrigerant tube to the valve body in a fluid tight manner.

7. The method as in claim 6, wherein said refrigerant tube is secured to the valve body without removing material from the surface of the valve.

8. The method as in claim 6, wherein said surface of said valve body around the bore is formed such that a portion of the valve body material entirely surrounds the bead and at least partially encloses the bead within the counterbore.

9. The method as in claim 6, wherein said step of mechanically staking the surface of the valve body comprises forcing a die into the surface of the valve body.

10. The method as in claim 9, wherein a shoulder is defined between the bore and counterbore, said shoulder defining a sharp edge, and said sharp edge cuts into a concave junction formed by the tube and the bead when the surface is mechanically staked to seal the tube to the valve body in a fluid-tight manner.